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Application of: ARONSON et al.		Confirmation No.:	6191
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Filed:	February 5, 2001	Examiner:	Not yet assigned
For:	*Integrated Memory Mapped Controller Circuit for Fiber Optics Transceiver*	Attorney Docket No:	9775-0052-999

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S I R:

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diode 36 is coupled from the front facet of the laser diode into optical fiber 38. Back facet photo diode 40 is used as a monitor to determine the amount of optical power admitted into optical fiber 38.

The current through laser diode 36 consists of two primary components: the bias current and the modulation current. The bias current is a DC current component, while the modulation current is a varying component that correlates with the incoming digital data. The current through modulation current path 34 is monitored by microcontroller 50 via multi-channel analog-TO-digital converter 52.

The amount of DC bias current is controlled with an analog control loop in conjunction with back facet monitor photo diode 40, duty cycle reference transistor pair 16 and error amplifier 54. An appropriate modulation current, as determined by stored characterization data, is applied to laser diode 36 as controlled by microcontroller 50, which monitors temperature through temperature sensor 56. As a result, the modulation current is adjusted for temperature.

For a calibrated module, microcontroller 50 enters a scan loop iterating a laser control algorithm. Such a scan loop algorithm is shown in Fig. 14 as steps 236 - 244, wherein a measurement is made of the current operating conditions and either an index into a table is computed or polynomial equations are solved based on operating conditions, tracking error adjust DAC is updated, modulation current control DAC is updated, the bias current is checked against the indexed "end-of-life" criteria, and statistical data is updated, e.g. highest and lowest temperature, extreme bias or operating conditions and bias observed, where the laser diode is disabled if conditions fall outside prescribed thresholds.

This reference does not, however, disclose, teach, or suggest a <u>single-chip integrated circuit</u> containing the elements of the independent apparatus claims 1, 14, 25, 52 and 55. By including all the recited elements in a single-chip integrated circuit, the overall optoelectronic transceiver package can be smaller, thereby saving space and costs.

This reference also does not disclose storing digital values within <u>predefined locations within the memory</u> and allowing a host device to <u>directly read from</u> and <u>write to</u> the predefined locations within the memory, as required by all of the independent claims. Storing the digital values in predefined locations within the memory is crucial to the proper operation of the present

invention. Having predefined locations within memory allows a host to know what part of the memory to access when it is looking for a particular digital value. Also, having predefined locations within the memory allows a host device to read the stored digital values from the predefined locations, whenever required. In other words, the host does not need to first request the digital values from the microcontroller, which then accesses the memory, receives the requested digital values, and transmits them back to the host. Similarly, having predefined locations in memory that are directly accessed by the host, allows the host to write directly to the memory without having to instruct the microcontroller to access the memory and write the digital values to memory. This not only speeds-up access memory access times, but also relieves the microcontroller from performing these tasks, thereby releasing the microcontroller to perform other functions. Accordingly, the optoelectronic transceiver has faster memory access and may even require a less powerful microcontroller.

What is more, this reference does not disclose, teach, or suggest comparing digital values with limit values to generate flag values and storing these flag values into the predefined locations within the memory during operation of the optoelectronic transceiver, as required by independent claims 1, 25, 26, and 50. In the present invention, these stored flag values may be accessed directly by the host, as described above.

U.S. Patent 5,953,690

This reference discloses an intelligent fiberoptic receiver 500 and methods of manufacturing and operating the same. During calibration procedures for the receiver, the optical-to-electrical conversion device (photodiode 501) and its supporting control and monitoring circuits in the receiver module are characterized over a defined operating temperature range. Control values, determined during calibration are stored in non-volatile memory 526, but no new values are stored in the memory 526 during operation of the device. The values stored in the memory 526 are read (during operation of the device) and used as control values. During operation, an embedded microcontroller 520 together with analog to digital converters 532, digital to analog converters and other associated circuitry, dynamically control the operational parameters of the module based on the current operating conditions (temperature, power supply).

This reference does not, however, disclose, teach, or suggest a single-chip integrated circuit containing the elements of the independent apparatus claims 1, 14, 25, 52 and 55. By including all the recited elements in a single-chip integrated circuit, the overall optoelectronic transceiver package can be smaller, thereby saving space and costs.

This reference also does not disclose storing digital values within predefined locations within the memory and allowing a host device to directly read from and write to the predefined locations within the memory, as required by all of the independent claims. For example this reference shows that a host request first accesses the microcontroller 520, which in turn access the memory 526 via the module serial bus 522 (see Figs. 2A and 2B).

Storing the digital values in predefined locations within the memory is crucial to the proper operation of the present invention. Having predefined locations within memory allows a host to know what part of the memory to access when it is looking for a particular digital value. Also, having predefined locations within the memory allows a host device to read the stored digital values from the predefined locations, whenever required. In other words, the host does not need to first request the digital values from the microcontroller, which then accesses the memory, receives the requested digital values, and transmits them back to the host. Similarly, having predefined locations in memory that are directly accessed by the host, allows the host to write directly to the memory without having to instruct the microcontroller to access the memory and write the digital values to memory. This not only speeds-up access memory access times, butt also relieves the microcontroller from performing these tasks, thereby releasing the microcontroller to perform other functions. Accordingly, the optoelectronic transceiver has faster memory access and may even require a less powerful microcontroller.

What is more, this reference does not disclose, teach, or suggest comparing digital values with limit values to generate flag values and storing these flag values into the predefined locations within the memory during operation of the optoelectronic transceiver, as required by independent claims 1, 25, 26, and 50. In the present invention, these stored flag values may be accessed directly by the host, as described above.

U.S. Patent 5,019,769

This reference discloses a semiconductor laser diode controller and laser diode biasing

control method. The laser diode controller uses a programed digital controller to measure a laser diode's operating characteristics and to control the process of turning on and selecting the operating parameters of the diode. The controller records the operating characteristics of the laser diode in non-volatile memory, analyzes changes in those characteristics, and generates a failure warning message when those changes correspond to predefined failure prediction criteria.

Referring to Fig. 8, when the controlled laser diode begins normal operation, steps 414 - 418 are repeated periodically so that the controller can monitor the operability of the laser diode. The host computer can then periodically request the maintenance data from the microcontroller via a RS232 interface. The microcontroller can then retrieve this data and send it back to the host computer.

This reference does not, however, specifically disclose or suggest a <u>single-chip integrated circuit</u> containing the elements of the independent apparatus claims 1, 14, 25, 52 and 55. By including all the recited elements in a single-chip integrated circuit, the overall optoelectronic transceiver package can be smaller, thereby saving space and costs.

This reference also does not disclose allowing a host device to <u>directly</u> <u>read from</u> and <u>write to</u> the predefined locations within the memory, as required by all of the independent claims. For example, as can be seen in Fig. 3 of this reference, the host computer 202 must first access the microcontroller 162, which in turn accesses the memory 166.

Unlike this reference, the present invention, as claimed, allows a host to directly access predefined locations in the memory to read stored digital values whenever required. In other words, the host does not need to first request the digital values from the microcontroller, which then accesses the memory, receives the requested digital values, and transmits them back to the host. Similarly, having predefined locations in memory that are directly accessed by the host, allows the host to write directly to the memory without having to instruct the microcontroller to access the memory and write the digital values to memory. This not only speeds-up access to the memory, but it also relieves the microcontroller from performing these tasks, thereby allowing the microcontroller to perform other functions. Accordingly, the optoelectronic transceiver has faster memory access times and may even require a less powerful microcontroller.

What is more, this reference does not disclose, teach, or suggest comparing digital values with limit values to generate flag values and storing these flag values into the predefined locations within the memory during operation of the optoelectronic transceiver, as required by independent claims 1, 25, 26, and 50. In the present invention, these stored flag values may be accessed directly by the host, as described above.

C. CONCLUSION

For at least the reasons set forth above, the claims, as amended, are patentable over the above references. Therefore, it is respectfully submitted that the claims are in condition for allowance.

Please charge the fee of $130.00 (37 C.F.R. 1.17(i)) and any additional fees to Pennie & Edmonds LLP, Deposit Account No. 16-1150 (9775-0052-999).

Respectfully submitted,

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